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ABSTRACT

Developed by the Initial Learning in Mainstreaming Project, the manual presents an instructional program to teach mainstreamed handicapped elementary school students multiplication with multipliers of up to three digits. In addition to detailed teaching instructions and text of tape recordings for students, the manual includes tests, worksheets, and pages to be made into transparencies for projection. (DIS)

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MULTIPLE MULTIPLIERS
(To 3 Digit)

BY FERN S. TIPTON
With
NELDON KINGSTON

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Title III 306 E.S.E.A.
Initial Learning in
Mainstreaming Project
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I

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Multiplication

Transparencies	Worksheets & Tests
#1	Entrance..... Record
#2..... Tape Presentation 1	01..... Record
#3	02
#4	03
#5	04
#6..... Tape Presentation 2	05
#7..... Tape Presentation 3	06
#8..... Tape Presentation 4	07
#9..... Tape Presentation 5	08
#10..... Tape Presentation 6	09
#11	10..... Record
#12..... Tape Presentation 7	11
#13..... Tape Presentation 8	12
#14..... Tape Presentation 9	13
#15	14
#16	15
#17	16
#18	17
#19	18
#20.... Tape Presentation 10	19
#21.... Tape Presentation 11	20
#22.... Tape Presentation 12	21..... Record
#23.... Tape Presentation 13	22
#24	23
#25	24
#26.... Tape Presentation 14	25
#27.... Tape Presentation 15	26
#28.... Tape Presentation 16	27
#29.... Tape Presentation 17	28
	29
	30..... Record
	31
	32
	33
	34
	35
	36
	37
	38
	Final Test..... Record

	Transparencies	Worksheets
2 Digit Multiplier	1 through 10	pg. 1-3 - pg. 4-9 optional
3 Digit Multiplier	11 through 14	pg. 10-12 - 13-18 optional
0 in the Multiplicand	15 through 17	pg. 19-20
Zero as a Multiplier	18 through 23	pg. 21 - 24-29 optional
Multiple Zero Multiplier	24 through 29	pg. 30-32 - 33-38 optional

Note: Included in the back of this manual is an evaluation sheet. Teacher, please make notations (suggestions for improvement, etc.) on this as you use the material. Be specific and indicate by illustration when possible.

Dear Teacher:

Thank you for your cooperation! It is important that you follow this manual as closely as possible.

This manual uses rules (or steps if you prefer) to teach. The purpose of the rules is to allow students just learning the process or students having trouble to have guidance in what to do. Once the student knows how to do the problem he will, in all likelihood, no longer think of the rules. Rather he will just go ahead and work the problem.

It is hoped that a sufficient supply of worksheets is provided for any classroom situation. It may not be necessary to use all of the worksheets provided. As a rule of thumb, however, too much practice is preferable over too little practice. Problems on the worksheets are controlled to coincide with the instructional section in the manual,(i.e. there are no zeros in the multiplier until that unit is taught).

FEAR NOT

THIS MANUAL
is not as
AWESOME
as its size
might suggest

As we contemplate the use of this table, we anticipate two uses of it.

1. For students learning their multiplication or division facts. In this case they would be used in combination with the extra practice worksheets of the Initial Learning in Mainstreaming Project.

2. For students not knowing their multiplication and/or division facts very well and trying to master a process requiring the accurate use of them.

USING THE MULTIPLICATION AND DIVISION TABLE

Material Needed

1. Student Cards (passed out)
2. Transparency of student card

Using the transparency, explain to the students in your own words how the cards are used. Use as many examples as needed for all students needing to use the cards to understand. If you are only interested in multiplication do not give division examples. If you are interested in division give both multiplication and division examples as both are required facts.

The following samples are for your own information.

Problem: 7 x 9

x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

Answer

Problem: $9\overline{)63}$

Answer

x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

Go Across Row — READ ANSWER

Till find 63 or number closest to it.

5

In long division problems like $8\overline{)58}$, where the number doesn't come out even (hense long division is involved) tell students to use the number closest to it <u>WITHOUT GOING OVER</u> to get their answer row number i.e.

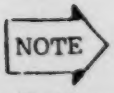
x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

Go across Row

Till find number closest to it without going over.

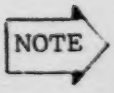
It is important to recognize that the use of this table is a crutch to be used only for those students not having fact mastery necessary to learn the process trying to be taught. The use of the table should be withdrawn as rapidly as is feasible.

THIS INSTRUCTIONAL UNIT ASSUMES THAT THE SINGLE DIGIT MULTIPLIER IS A PROCESS KNOWN BY THE STUDENTS.



Entrance Test

Give the Entrance Test to check this assumption out.



Test Records

The test record form is located at the rear of the manual just before the keys.

The Process we have devised for developing mastery of each concept may involve all or some of the following:

(1) Teacher Presentation

(2) Recordings and Overlays:
  (1) Recordings to establish controlling rules & show how learning is facilitated by coded overlays.

  (2) Recordings to reinforce Teacher Presentation through auditory and visual means.

(3) Worksheets to accompany each recording.

(4) Strip films to provide help in areas of possible error. (For child who needs more help than is provided in regular presentation.)

(5) Practice sheets to further facilitate mastery of rules and concepts.

(6) C. R. Tests and monitoring.

(7) Other media such as: card readers, super 8 presentations, flash card drill, digitor, hand manipulators, number lines, tapes and recorders, stop watches, timers, etc.

IMPORTANT

Before you begin with any of the concepts to be treated, FAMILIARIZE YOURSELF WITH ALL OF THE MATERIAL CONCERNING THAT CONCEPT. PARTICULARLY, listen to the recordings before giving the teacher presentation. By doing this you'll have an understanding of the entire block.

Follow the directions as closely as possible.

You may want to use your own words part of the time but remember to stick to the script in such areas as:

STATEMENT OF RULES

SENTENCES INTENDED TO REINFORCE RULES

SENTENCES INTENDED TO CLARIFY PROCESS SO THAT POSSIBLE ERRORS IN INITIAL LEARNING MAY BE AVOIDED.

Where gesturing is indicated, you may devise excellent methods of your own, but be sure to:

Circle in air above entire number when several are used as a multiplier i.e. (325). Sweep hand across to indicate an entire row or a direction (such as from right to left, etc.) or up and down to indicate a column.

NOTE

Problem A and B of <u>each</u> worksheet #1 (these are boxed in) has an accompanying cassette tape as a check to be used after the students have worked the respective problems. It may be helpful for the teacher to listen to these recordings in advance so as to be familiar with them and the accompanying overlay before it is presented to the students. Listening to these in advance will also prove helpful to the teacher in the initial presentations by suggesting a format to work from.

IMPORTANT

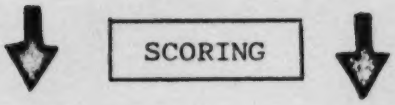
In the sample dialogue it is the statement and illustration of the rules and how they apply to the problem as the process is explained that is critical.

IMPORTANT

Some example problems contain specific irregularities and are included for this reason. These problems have statements made as to why they are used as examples. Be sure to point these things out to the class. Generally a brief statement regarding the explanation is provided, i.e. Lesson 1 - Part 2 - Page 2. 43 x 235.

VERY IMPORTANT

The format of this teaching unit is fairly informal compared with some other teaching units. For example, often as new problems are introduced no formal statement is made regarding this but it can be noted by the showing of a new problem in the right hand portion of the page and the availability of a new transparency to correspond to the new problem. In many cases, no sample dialogue is provided. The teacher should explain the process in her own words MAKING SURE TO STATE THE CONTROLLING RULES AND SHOW HOW THEY APPLY TO THE PROBLEM.



On worksheets, practice sheets and tests you will find a score box that looks like this.

Score
Process_____
Total_____

PROCESS refers to whether the student did the process correctly irregardless of whether the problem itself is correct. This score can only be used when the teacher is correcting as students just learning a concept can not be expected to score for that concept.

TOTAL refers to the number of problems correct. This can be student scored as only the answer is of concern.

The reason for both scores is so a student who maybe knows the process but continually misses problems because of other problems, such as missing facts, still can get the feedback that he is correct in the way he does the process. What may happen if such a student doesn't get this feedback is that he/she may think they don't know the process and start trying some type of exotic solution to process.

AS A MINIMUM

process should be scored for on

(1) The final test for students receiving low total scores.

(2) Worksheets and practice sheets of students who have low total scores.

This need not be as time consuming as one might think, as students correcting can be used for the total score and one need only quickly eyeball papers of concern to determine if the process is being done correctly.

At times, scoring for a specific concept is called for. This generally is limited to tests. In these cases scoring is for PROCESS ONLY.

RECORDS

Record forms and sample record forms are located at the rear of the manual just prior to the keys. There is a separate record form for worksheets and tests. ONLY THE INSTRUCTIONAL WORKSHEETS (THOSE WITH BOXED PROBLEMS) ARE RECORDED. In many cases, recording can be aided by student correcting and reporting their own scores with the teacher doing a random check of papers. This is especially true of the worksheets. Teachers may take scores on practice exercises if they desire but no provision is made for this in the manual. The record forms are made so that the name sections may be superimposed on top of each other with the top name section being cut out. This saves having to list student names twice.

There are also blank record forms included if the teacher desires to use them for her own records.

FIRST

Place the transparency containing the rules on the overhead projector and go over the rules with the students.

Use Transparency #1

MULTIPLICATION PROCESS TO 3 DIGIT MULTIPLICATION

(Teacher Presentation #1)

Lesson I Part I - 2 Digit Multiplier

SAMPLE DIALOGUE:

"Today we're going to learn how to multiply with a 2 digit multiplier."

(Give positive attention statement, such as:)

"I like the way you're all looking up here at me and listening to what I say."

Present the problem to the students. The problem is on a transparency or overlay. If an overhead projector is not available, a blackboard may be used. The teacher writes on the overlay as the tape explains the computation.

$$\begin{array}{r} 67 \\ \times\ 21 \\ \hline \end{array}$$

Use transparency #2 and tape presentataion #1.

This problem was chosen to use first because there are no irregularities. It is a typical 2 digit multiplier type.

$$\begin{array}{r} 67 \\ \times\ 21 \\ \hline 67 \\ 1340 \\ \hline 1407 \end{array}$$

MULTIPLICATION PROCESS TO 3 DIGIT MULTIPLICATION
(Teacher Presentation #1)

Lesson I Part 2 - 2 Digit Multiplier

SAMPLE DIALOGUE

Use Transparency #3

"Now, you may have other problems where there will be 3 or more numbers in the top row for a 2 digit multiplier to multiply. (Place overlay #3, showing this on the projector). You may have one like this, or even this: That's fine. The same rules apply and you'll be able to do these problems with no difficulty. We'll work one that has 3 numbers up on top to help you discover this."

Teacher presents this problem to the class at this time. It has 3 digits in the top row. She writes on the overlay as she explains the process.

346
x 31

Use transparency #4
No tape - teacher explanation.

BY

Stating the controlling rules.....

AND

Rules:
(1) Have a row for each multiplier except 0.
(2) Add a 0 at the beginning of the row for each number to the right of the one you're multiplying with.
(3) Add the rows to get your answer.

Working the example through for the class to watch. She makes the appropriate gestures and illustrations, etc. as necessary to aid in comprehension of process.

Add

$$\begin{array}{r} 346 \\ \times\ 31 \\ \hline 346 \\ 10380 \\ \hline 10726 \end{array}$$

Transparency #5
No tape - teacher presentation

NEXT

There is a slight irregularity in this problem:

$$\begin{array}{r} 235 \\ \times\ 43 \\ \hline 1105 \\ 9400 \\ \hline 10505 \end{array}$$

It involves a number fact ending in 0. After you've applied rule 2 and placed a 0 at the beginning of the row, the fact 4 x 5 ends in 0 and you see 2 zeros at the beginning of the row. There may be some confusion. Simply explain that 20 is a number fact and you treat it exactly as any other number fact. Follow the same procedure with this problem as with the previous problems, as illustrated in the sample dialogue.

REMEMBER

to state and illustrate the rules.....

Rules:

(1) Have a row for each multiplier except 0.

(2) Add a 0 at the beginning of the row for each number to the right of the one you're multiplying with.

(3) Add the rows to get your answer.

NEXT

A TAPE - TRANSPARENCY

PRESENTATION

TO

REINFORCE THE RULES

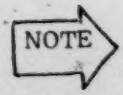
Use transparency #6
Tape Presentation #2

NEXT

A TAPE-TRANSPARENCY PRESENTATION

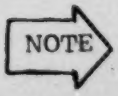
TO SET THE RULES AND PROCESS

Use Tape Presentation #3
Transparency #7



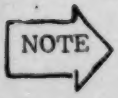
Worksheets

This is followed by worksheet examples and a tape - transparency checking system for the two problems boxed on the worksheet.



Practice Sheets

Follow up practice sheets have 25 problems on them. Teachers may assign all or part of the problems. They may use a variety such as problems 1-10 the first day and 11-25 the second day.



Correction Keys

Keys for worksheets and practice sheets are located at the rear of the manual.

Assign Problem A Worksheet #1

Teacher walks around room while children are working, paying close attention to those having trouble. As she offers help, she should relate to the rule such as: "Do you remember the rule? The rule says..... etc. Follow the rule and you will be all right."

Use transparency #8 - tape presentation #4 to correct Problem A.

Teacher asks for any questions and provides explanations to questions, etc. By a show of hands, ask how many got problem A right. Record this on the record form. She then instructs children to do problem B and checks with students who had trouble on problem A to see what they did wrong. Problem B is used to help these students.

To correct Problem B use transparency #9 and tape presentation #5.

REMEMBER

When giving help relate the help to the rules.

Problem B is recorded in the same manner as Problem A.

When Problem B has been corrected, it is recorded in the same manner as Problem A.

Assign the rest of worksheet #1. While the class works on the worksheet, help those students who had trouble on Problem A or B.

Worksheet #1 is corrected. When the class is finished record the total score and check and record process scores for those pupils having less than 80% on their total scores.

NOW COMES

A TAPE - TRANSPARENCY

PRESENTATION

TO ILLUSTRATE THAT

THE RULES STILL WORK

IRREGARDLESS OF HOW

MANY NUMBERS ARE IN

THE MULTIPLIER.

Use transparency #10 - tape presentation #6

This is followed by a section on 3 digit multipliers.

MULTIPLICATION PROCESS TO 3 DIGIT MULTIPLICATION
(Teacher Presentation #2)

Lesson II - Part I - 3 Digit Multiplication

Do a dry run through the problem first before doing the classroom presentation, in order to have the rules, how they apply and a dialogue structure in mind before explaining it to the class.

Use Transparency #11 - No tape - Teacher Explanation

Present the problem to the students. The problem is on a transparency. The teacher writes on this overlay as she explains the process of multiplying with a 3 digit multiplier.....

BY

Stating the controlling rules to begin with.....

```
  436
x 524
 1744
 8720
218000
228464
```

Rules:

(1) Have a row for each multiplier except 0.

(2) Add a 0 at the beginning of the row for each number to the right of the one you are multiplying with.

(3) Add the rows to get your answer.

AND

Working the problem for the students. Show how the rules apply in every step. Make enough gestures, such as circling (to indicate an entire multiplier), pointing, sweeping hand across to indicate rows or up and down to stress columns. You must be sure they understand which number you mean, etc.

436
x 524
1744
8720
218000
228464

This problem was chosen for you to present, because there is a number fact involving zero which may confuse some children. You may want to clarify it at this point - to avoid future error. Simply explain that the fact 30 ends in a 0 and you treat it as any other fact. Follow the same procedure with this problem as with previous problems.

436
x 524
1744
8720
218000
228464

Because previous examples of dialogue have already been given for a different problem on tapes, etc., there is no need to provide another. The teacher should note that great emphasis has been put on important points, in the dialogue, to prevent error and faulty learning. You will also notice that there are many references to the basic rules. This is to reinforce these rules and to impress upon the students' minds how to apply these rules in computation.

REMEMBER

to state and illustrate the rules.

Rules:

(1) Have a row for each multiplier except 0.

(2) Add a 0 at the beginning of the row for each number to the right of the one you are multiplying with.

(3) Add the rows to get your answer.

Next use transparency #12 and tape presentation #7 to provide another example.

Assign Problem A - Worksheet #10

Teacher walks around room while children are working, paying close attention to those having trouble. As she offers help she should relate to the rule . "The rule says....., etc. Follow the rule and you will be all right."

When the class is ready, correct problem A by.....

Placing transparency #13 on projector and using tape presentation #8.

Teacher asks for any questions and provides explanations to questions, etc. Take scores as on previous A problems. Instructs children to do problem B. Help pupils having trouble with Problem A while the class works Problem B. Problem B is used to give this help. When they have finished, put transparency #14 on the projector, turn tape presentation #9 on and proceed as in Problem A.

Correct and record worksheet #10 in the same manner as worksheet #1. Use worksheets #11-#18 as needed for the class. Re-use transparencies, tape presentations etc. as needed.

Zero in the Multiplicand

Zero in the multiplicand (top) row is a situation that throws some students.

Basically all it amounts to is a fact situation, some number times zero. But many students fail to recognize this. To assist students in recognizing this a small subsection on this follows.

It includes:

(1) 2 transparencies (#15 & #16)
(2) A set of worksheets (#19 & #20)
(3) A brief remedial tape-paper remedial loop

On the transparencies (item 1 above) the teacher should work out the problems as usual making sure to state and reinforce how the rules apply to the problem.

WHEN THE TIMES 0 SITUATION OCCURS, THE TEACHER SHOULD MAKE THE POINT THAT THIS SITUATION IS LIKE ANY OTHER FACT, EXPLAIN THAT THE NUMBER TIMES 0 EQUALS 0 AND GO ON WITH THE PROBLEM. POINT OUT IT IS TREATED LIKE ANY OTHER NUMBER IN THE TOP ROW.

The worksheets have some problems with zero and some without. This can be explained to the students in advance.

Students still showing some difficulty with this concept can be referred to the remedial tape-paper loop.

UNTIL NOW ZERO HAS BEEN OMITTED FROM THE MULTIPLIER. THE REMAINING LESSONS INTRODUCE ZERO AS A MULTIPLIER.

NOTE

On the practice sheets there are problems included that do not have zeros in the multiplier. THIS MAY BE POINTED OUT TO STUDENTS IN ADVANCE. The purpose of this is to prevent students from indiscriminatly trying to use the special zero rule.

NOTE

Remedial loop

For students still having difficulty after the presentations are completed there is a remedial loop provided. Teachers having questions about how the zero rule applies may wish to view this loop in advance of instruction.

IMPORTANT

Theory Explanation

DO NOT make an explanation at this time as to why the zero rule works. This can be done after the process is mastered if you desire. Your textbook may be used for this purpose if you desire. If a question is raised by a student regarding this, tell him/her that, if they remind you, you will explain it to them either after class or to the whole class in a couple of days but that it might confuse some of the class if you did now. THE REASON IT IS SUGGESTED TO BE HANDLED THIS WAY IS THAT THE EXPLANATION MAY CREATE PROCESS CONFUSION FOR SOME MEMBERS OF THE CLASS.

BEFORE

Starting the units with 0 as a multiplier place the rules transparency that contains the zero rule on the projector. Go through the rules with the students pointing out the addition of the zero rule. Also make sure to make a point of the fact that Rule 1 says <u>except 0</u>.

Use Transparency #17 - no tape presentation

MULTIPLICATION PROCESS TO 3 DIGIT MULTIPLICATION
(Teacher Presentation #3)

Lesson III - Part I - Zero as a Multiplier

Do a dry run through the problem first before doing the classroom presentation in order to have the rules, how they apply and a dialogue structure in mind before explaining it to the class.

Present this problem to the students. The problem is on transparency #18 and the teacher, using a wax crayon or erasable marking pen writes on the transparency as she explains the process.....

$$\begin{array}{r} 573 \\ \times\ 340 \\ \hline \end{array}$$

Use Transparency #18, no tape presentation

BY

Stating the controlling rules to begin with. Here is where the children learn what we mean in rule 1 when we say "except zero". She points out the addition of the zero rule...

Rules:

(1) Have a row for each multiplier except 0.

Zero Rule
When you come to a 0 in the multiplier, skip it, go on to the next number and apply rule 2.

(2) Add a 0 at the beginning of the row for each number to the right of the one you're multiplying with.

(3) Add the rows to get your answer.

AND

She works the problem for the students, showing how each rule applies to that particular process. She demonstrates by gestures, arrows, etc. making important points as well defined as possible to avoid error.

Add

$$\begin{array}{r} 573 \\ \times\ 340 \\ \hline 22920 \\ 171900 \\ \hline 194820 \end{array}$$

Lesson III - Part II

Present this problem showing 0 in the middle. Teacher computes on transparency #19 as she explains the process.....

532
x 104

Use Transparency #19 - no Tape Presentation

BY

Stating the controlling rules to show how they determine the process.....

Rules:

(1) Have a row for each multiplier except 0.

Zero Rule
When you come to a 0 in the multiplier, skip it, go on to the next number and apply rule 2.

(2) Add a 0 at the beginning of the row for each number to the right of the one you're multiplying with.

(3) Add the rows to get your answer.

AND

IMPORTANT

Compute the problem, pointing out that "no matter <u>where</u> the 0 is in the multiplier - and no matter <u>how many</u> zeros there are," the zero rule still applies.

532
x 104
2128
53200
55328

NEXT

is the Tape-Transparency presentation to reinforce the rules.

Use Transparency #20, Tape Presentation #10

THIS

is followed by a Tape-Transparency presentation to set the rules and process.

Use Transparency #21, Tape Presentation #11

AFTER THIS

comes the worksheet with Tape-Transparency presentation to correct problem A and B on the worksheet. This is done in the same manner as on previous worksheets in other sections.

Use Transparency #22, Tape Presentation #12 for Problem A Use Transparency #23, Tape Presentation #13 for Problem B

THE WORKSHEET

is followed by two practice sheets to give practice in what the students have learned.

THE NEXT SECTION
DEALS WITH MULTIPLE ZERO
SITUATIONS SUCH AS 400
IN THE MULTIPLIER

The lessons start with one zero, such as in 20, in the multiplier

MULTIPLICATION PROCESS TO 3 DIGIT MULTIPLICATION

(Teacher Presentation #4)

Lesson IV Part I

Present this problem to the students. Teacher writes on transparency as she explains process.....

$$\begin{array}{r} 251 \\ \times\ 30 \\ \hline \end{array}$$

Use Transparency #24, no Tape Presentation

BY

Stating the rules and correlating them with the process as the children watch. Here, again, is where they learn what we mean in rule 1 when we say "except 0". Teacher draws attention to the zero rule.....

Rules:

(1) Row for each multiplier except 0.

Zero Rule:
When you come to a 0 in the multiplier, skip it, go on to the next number and apply rule 2.

(2) Add a 0 at the beginning of the row for each number to the right of the one you're multiplying with.

(3) Add the rows to get your answer.

AS

She works the problem for the students. The arrows are just a suggestion - how we use illustration, etc. to facilitate learning.

$$\begin{array}{r} 251 \\ \times\ 30 \\ \hline 7530 \end{array}$$

LESSON IV PART II

Present this problem to the students. Teacher shows how the same rules apply when there is more than one 0 in the multiplier.....

581
x 400

Use Transparency #25, no Tape Presentation

BY

Stating the rules and pointing out how the rules apply to the problem as the problem is worked.

Rules:

(1) Row for each multiplier except 0.

Zero Rule
When you come to 0 in the multiplier, skip it, go on to the next number and apply rule 2.

(2) Add a 0 at the beginning of the row for each number to the right of the one you're multiplying with.

(3) Add the rows to get your answer.

It can be stated that there is nothing to add because in this problem there is only one answer row when you get to rule 3.

THEN

You may also want to say that the same thing works with more zeros. Just following the same rules and add zeros to the 400 and the answer to illustrate. The best way to accomplish this may be to clean the transparency, add a zero to the 400, making it 4000, and work it through as a separate new problem.

581
x 400
232,400

NEXT

Use Transparency #26 and Tape Presentation #14

THEN

Use Transparency #27 and Tape Presentation #15

After tape presentation #15 is through, assign problem A - Worksheet #30.

Use Transparency #28 and tape presentation #16 to correct problem A.

Correcting and recording of problem A & B follow the same format and procedure as previous worksheets with A and B problems on them.

AFTER

Problem A is corrected and recorded assign problem B.

Use transparency #29 and tape presentation #17 to correct problem B.

HELP should be given pupils having difficulty as explained in previous sections.

Assign worksheet pages as needed by the class to set the concept. Transparencies, etc. may be re-used as needed for additional class instruction.

Make sure the class gets plenty of practice so they won't forget how to do the problem.

Make sure that some of the worksheets #35-#38 are used so that students get practice with the different types of problems altogether.

AT LAST

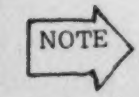
THE FINAL TEST

Record the results on the record form under the various categories.

Make special note of students still having difficulty with the concepts.

IMPORTANT

Be sure to use the remedial loops with students still having problems. Keep re-using them (or other materials) until students show concept mastery.



Reviewing

It is highly desirable for the teacher to assign review exercises from time to time after instruction is complete. Practice exercises from your textbook can be used for this purpose, or you may use unused pages or review pages in the student workbook. Remedial loop filmstrip may be shown the class as a review.

TEST

Multiple Multipliers

42

Score
Process_____
Total_____

Date_____

Name_____

Do these problems. Do all of your work on this page.

(1) 47 x 38

(2) 337 x 54

(3) 309 x 52

(4) 346 x 52

(5) 39 x 20

(6) 56 x 23

(7) 683 x 247

(8) 729 x 304

(9) 827 x 530

(10) 867 x 600

REMEDIAL LOOPS

To be assigned to students showing the specific problem covered by the loop after classroom instruction of the concept is completed. Students may take the loop more than once if needed.

Multiple Multiplier
Worksheet Record

Record in %

P = Process
T = Total

Begin Date_____

End Date_____

Students	Worksheet #1 - A 2 Digit Multiplier P/T	Worksheet #1 - B 2 Digit Multiplier P/T	Worksheet #1 Problems 1 - 5 2 Digit Multiplier P/T	Worksheet #10 - A 3 Digit Multiplier P/T	Worksheet #10 - B 3 Digit Multiplier P/T	Worksheet #10 Problems 1 - 5 3 Digit Multiplier P/T	Worksheet #21 - A Zero Multiplier P/T	Worksheet #21 - B Zero Multiplier P/T	Worksheet #21 Problems 1 - 5 Zero Multiplier P/T	Worksheet #30 - A Multiple Zero Multiplier P/T	Worksheet #30 - B Multiple Zero Multiplier P/T	Worksheet #30 Problems 1 - 5 Multiple Zero P/T	Comments

Multiple Multiplier
Worksheet Record

Record in %

P = Process
T = Total

Begin Date_____

End Date_____

Students	Worksheet #1 - A 2 Digit Multiplier P	T	Worksheet #1 - B 2 Digit Multiplier P	T	Worksheet #1 Problems 1 - 5 2 Digit Multiplier P	T	Worksheet #10 - A 3 Digit Multiplier P	T	Worksheet #10 - B 3 Digit Multiplier P	T	Worksheet #10 Problems 1 - 5 3 Digit Multiplier P	T	Worksheet #21 - A Zero Multiplier P	T	Worksheet #21 - B Zero Multiplier P	T	Worksheet #21 Problems 1 - 5 Zero Multiplier P	T	Worksheet #30 - A Multiple Zero Multiplier P	T	Worksheet #30 - B Multiple Zero Multiplier P	T	Worksheet #30 Problems 1 - 5 Multiple Zero P	T	Comments

Remedial Loop
Record Sheet

P = Process

Students	0 in the Multiplicand	0 in the Multiplier	3 Digit Multiplier				Comments
	P	P	P				

Remedial Loop
Record Sheet

P = Process

Students	0 in the Multiplicand P	0 in the Multiplier P	3 Digit Multiplier P				Comments

x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

MULTIPLICATION RULES

(1) Have a row for each multiplier except 0.

(2) Add a 0 at the beginning of the row for each number to the right of the one you are multiplying with.

(3) Add the rows to get your answer.

2

$$\begin{array}{r} 67 \\ \times\ 21 \\ \hline \end{array}$$

3

$$\begin{array}{r} 232506 \\ \times\ 56 \\ \hline \end{array}$$

$$\begin{array}{r} 327 \\ \times\ 56 \\ \hline \end{array}$$

4

$$\begin{array}{r} 346 \\ \times\ 31 \\ \hline \end{array}$$

5

$$\begin{array}{r} 235 \\ \times\ 43 \\ \hline \end{array}$$

6

$$\begin{array}{r} 43 \\ \times\ 32 \\ \hline 86 \\ 1290 \\ \hline 1{,}376 \end{array}$$

Rules:

(1) Have a row for each multiplier except 0.

(2) Add a 0 at the beginning of the row for each number to the right of the one you're multiplying with.

(3) Add the rows to get your answer.

$$
\begin{array}{r}
21 \\
\times\ 23 \\
\hline
63 \\
420 \\
\hline
483
\end{array}
$$

8

$$\begin{array}{r} 43 \\ \times\ 54 \\ \hline \end{array}$$

9

$$\begin{array}{r} 564 \\ \times\ 32 \\ \hline \end{array}$$

10

$$
\begin{array}{r}
534 \\
\times\ 421 \\
\hline
534 \\
10680 \\
213600 \\
\hline
224{,}814
\end{array}
$$

Rules:

(1) Have a row for each multiplier except 0.

(2) Add a 0 at the beginning of the row for each number to the right of the one you are multiplying with.

(3) Add the rows to get your answer.

Transparency

11

$$\begin{array}{r} 436 \\ \times\ 524 \\ \hline \end{array}$$

12

$$
\begin{array}{r}
{\scriptstyle 2\ 1\ 3}\quad {\scriptstyle 1\ 1\ 2} \\
786 \\
\times\ 324 \\
\hline
3144 \\
15720 \\
235800 \\
\hline
254{,}664
\end{array}
$$

13

$$\begin{array}{r} 345 \\ \times\ 254 \\ \hline \end{array}$$

Transparency

14

$$\begin{array}{r} 637 \\ \times\ 365 \\ \hline \end{array}$$

Transparency

15

$$\begin{array}{r} 302 \\ \times\ 23 \\ \hline \end{array}$$

$$\begin{array}{r} 405 \\ \times\ 3 \\ \hline \end{array}$$

16

$$\begin{array}{r} 420 \\ \times \quad 4 \\ \hline \end{array}$$

$$\begin{array}{r} 630 \\ \times \quad 24 \\ \hline \end{array}$$

MULTIPLICATION RULES

(1) Have a row for each multiplier except 0.

Zero rule: When you come to a 0 in the multiplier, skip it, go on to the next number and apply rule 2.

(2) Add a 0 at the beginning of the row for each number to the right of the one you are multiplying with.

(3) Add the rows to get your answer.

Transparency

18

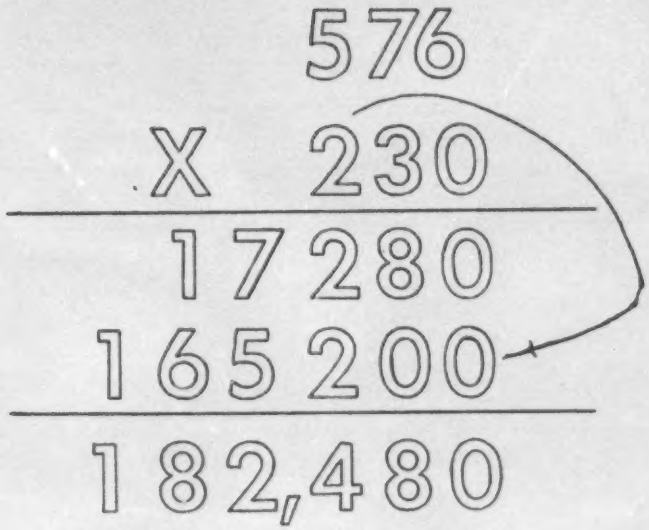
$$\begin{array}{r} 573 \\ \times\ 340 \\ \hline \end{array}$$

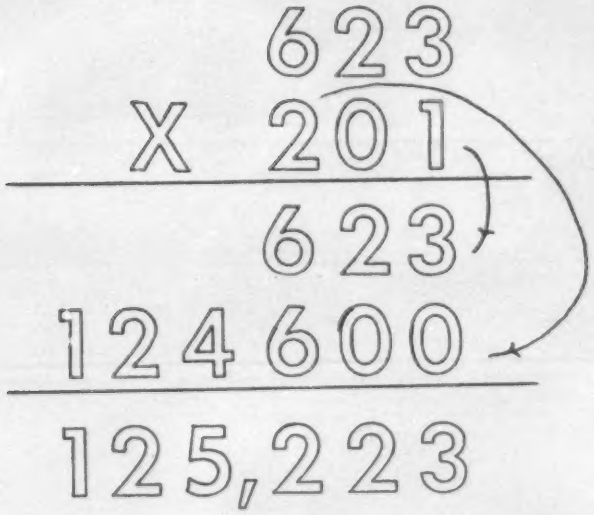
Transparency

19

$$\begin{array}{r} 532 \\ \times\ 104 \\ \hline \end{array}$$

20





Rules:

(1) Have a row for each multiplier except 0.

Zero Rule
When you come to a 0 in the multiplier, skip it, go on to the next number and apply rule 2.

(2) Add a 0 at the beginning of the row for each number to the right of the one you're multiplying with.

(3) Add the rows to get your answer.

21

$$
\begin{array}{r}
364 \\
\times\ 230 \\
\hline
10920 \\
72800 \\
\hline
83{,}700
\end{array}
$$

$$
\begin{array}{r}
514 \\
\times\ 302 \\
\hline
1028 \\
154200 \\
\hline
155{,}228
\end{array}
$$

Transparency

22

$$\begin{array}{r} 576 \\ \times\ 120 \\ \hline \end{array}$$

23

$$\begin{array}{r} 726 \\ \times\ 403 \\ \hline \end{array}$$

Transparency

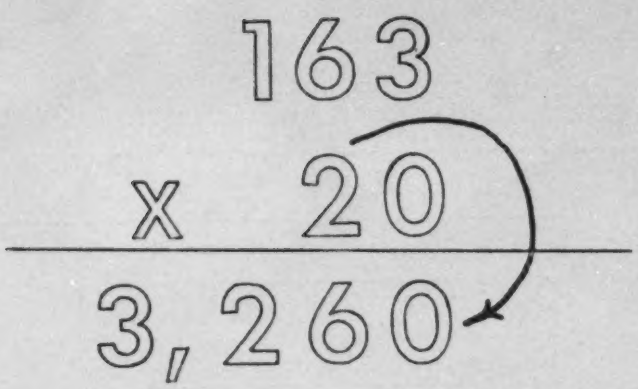
24

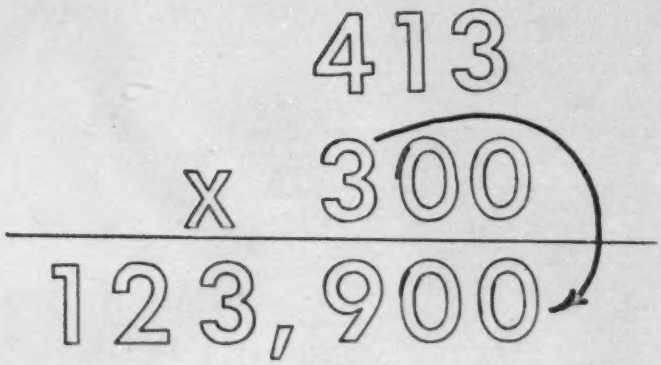
$$\begin{array}{r} 251 \\ \times\ 30 \\ \hline \end{array}$$

25

$$\begin{array}{r} 581 \\ \times\ 400 \\ \hline \end{array}$$

26





Rules:

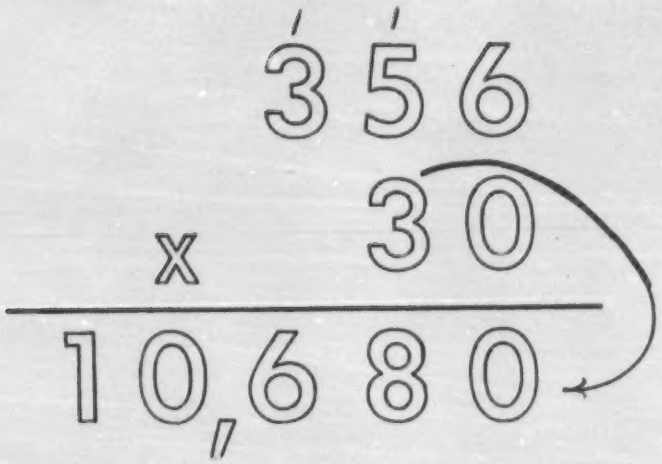
(1) Have a row for each multiplier except 0.

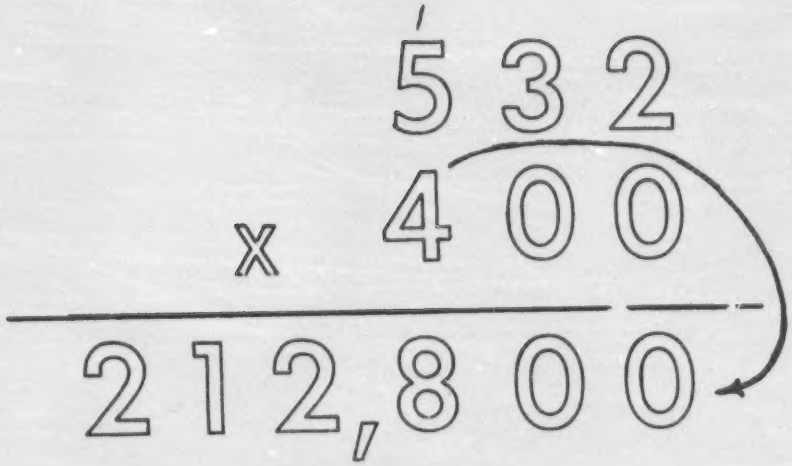
Zero Rule: When you come to a 0 in the multiplier, skip it, go on to the next number and apply rule 2.

(2) Add a 0 at the beginning of the row for each number to the right of the one you're multiplying with.

(3) Add the rows to get your answer.

27





28

$$\begin{array}{r} 634 \\ \times\ 40 \\ \hline \end{array}$$

29

$$\begin{array}{r} 782 \\ \times\ 300 \\ \hline \end{array}$$

Worksheet #1

Two Digit Multiplier in Multiplication

Score
Process____
Total_____

Name_____

Date_____

Add

```
  364
x  32
 728
10920
11648
```

Rules:

(1) Row for each multiplier except 0.
(2) Add a zero for each number at the right of the one you're multiplying with.
(3) Add the rows to get your answer

(A)

```
  43
x 54
 172
2150
2322
```

(B)

```
  564
x  32
 1128
16920
18048
```

(1)

```
  54
x 42
 108
2160
2268
```

(2)

```
  68
x 23
 204
1360
1564
```

(3)

```
  73
x 24
 292
1460
1752
```

(4)

```
  475
x  23
 1425
 9500
10925
```

(5)

```
  354
x  34
 1416
10620
12036
```

Note to Teacher: Item 4 on worksheet I may present a problem to a child since there will be more zeros involved. (A zero as the ending of a fact)

Worksheet #2

(1)	2,432	(11)	689	(21)	4,371
(2)	774	(12)	1,541	(22)	3,268
(3)	25,650	(13)	3,612	(23)	3,318
(4)	3,648	(14)	12,673	(24)	3,780
(5)	525	(15)	7,252	(25)	5,394
(6)	1,833	(16)	1,638		
(7)	2,106	(17)	4,305		
(8)	10,396	(18)	3,763		
(9)	30,874	(19)	1,802		
(10)	1,504	(20)	27,122		

Worksheet #3

(1)	437	(11)	903	(21)	925
(2)	2,886	(12)	627	(22)	1,166
(3)	16,102	(13)	570	(23)	6,319
(4)	1,581	(14)	1,215	(24)	468
(5)	37,474	(15)	4,982	(25)	14,615
(6)	1,960	(16)	14,976		
(7)	3,654	(17)	2,324		
(8)	42,696	(18)	8,833		
(9)	912	(19)	494		
(10)	3,886	(20)	1,323		

Worksheet #4

(1)	1,596	(6)	4,380
(2)	437	(7)	18,700
(3)	4,662	(8)	51,336
(4)	247	(9)	20,232
(5)	848	(10)	6,624

Worksheet #5

(1)	192	(6)	30,592
(2)	1,426	(7)	14,694
(3)	1,140	(8)	17,892
(4)	16,660	(9)	6,320
(5)	44,064	(10)	19,596

Worksheet #6

(1)	996	(6)	8,448	(11)	16,800	(16)	6,468
(2)	726	(7)	2,262	(12)	7,312	(17)	6,320
(3)	6,068	(8)	10,152	(13)	21,386	(18)	19,124
(4)	3,402	(9)	24,062	(14)	45,323	(19)	60,048
(5)	666	(10)	49,446	(15)	8,901	(20)	68,388

Worksheet #7

(1)	5,394	(6)	33,657	(11)	17,658	(16)	684
(2)	19,992	(7)	26,854	(12)	4,897	(17)	10,212
(3)	58,035	(8)	276	(13)	13,968	(18)	31,570
(4)	1,116	(9)	1,072	(14)	51,759	(19)	1,316
(5)	4,187	(10)	50,922	(15)	53,751	(20)	540

Worksheet #8

(1)	16,764	(6)	20,496	(11)	55,784	(16)	3,234
(2)	812	(7)	21,634	(12)	14,235	(17)	64,014
(3)	68,392	(8)	793	(13)	3,796	(18)	27,832
(4)	19,818	(9)	216	(14)	19,076	(19)	2,755
(5)	6,557	(10)	35,112	(15)	12,702	(20)	22,854

Worksheet #9

(1)	2,623	(6)	18,146	(11)	19,228	(16)	444
(2)	38,482	(7)	32,136	(12)	60,352	(17)	26,992
(3)	12,546	(8)	962	(13)	3,654	(18)	69,126
(4)	609	(9)	33,602	(14)	30,451	(19)	46,686
(5)	41,971	(10)	24,824	(15)	26,289	(20)	1,288

Worksheet #10

Three Digit Multiplier in Multiplication

Score
Process____
Total____

Name_____

Date_____

```
    332
  x 213
    996
Add 3320
  66400
  70716
```

Rules:

(1) Row for each multiplier except 0.
(2) Add a zero for each number at the right of the one you're multiplying with.
(3) Add the rows to get your answer.

(A)

```
   345
 x 254
  1380
 17250
 69000
 87630
```

(B)

```
   637
 x 365
  3185
 38220
191100
232505
```

(1)

```
   321
 x 234
  1284
  9630
 34200
 45114
```

(2)

```
   654
 x 215
  3270
  6540
130800
140610
```

(3)

```
   346
 x 242
   692
 13840
 69200
 83732
```

(4)

```
   632
 x 524
  2528
 12640
316000
331168
```

(5)

```
   534
 x 152
  1068
 26700
 53400
 81168
```

Note to Teacher: Items 4-5 on worksheet II may present a problem to a child since there will be more zeros involved. (A zero as the ending of a fact)

Worksheet #11

(1)	93,177	(11)	69,090	(21)	400,158
(2)	195,576	(12)	50,862	(22)	255,312
(3)	6,808	(13)	75,647	(23)	280,188
(4)	75,852	(14)	185,255	(24)	185,082
(5)	260,262	(15)	141,414	(25)	7,504
(6)	37,674	(16)	209,934		
(7)	44,044	(17)	98,625		
(8)	378,634	(18)	129,352		
(9)	179,559	(19)	9,546		
(10)	465,601	(20)	602,430		

Worksheet #12

(1)	63,273	(11)	36,408	(21)	112,563
(2)	391,666	(12)	69,987	(22)	74,784
(3)	67,768	(13)	92,115	(23)	62,271
(4)	200,277	(14)	41,148	(24)	56,462
(5)	45,594	(15)	166,257	(25)	236,318
(6)	135,636	(16)	149,868		
(7)	41,648	(17)	355,122		
(8)	41,528	(18)	97,341		
(9)	346,981	(19)	371,070		
(10)	67,886	(20)	5,891		

Worksheet #13

(1)	311,004	(6)	257,580
(2)	25,168	(7)	110,208
(3)	159,354	(8)	148,368
(4)	170,392	(9)	355,971
(5)	82,944	(10)	125,132

Worksheet #14

(1)	91,581	(6)	279,484
(2)	617,176	(7)	219,051
(3)	15,755	(8)	156,992
(4)	49,312	(9)	148,208
(5)	61,380	(10)	75,270

Worksheet #15

(1)	448,553	(6)	116,820	(11)	2,475	(16)	7,225
(2)	169,488	(7)	767	(12)	508,954	(17)	117,384
(3)	216,692	(8)	299,446	(13)	62,988	(18)	377,058
(4)	247,728	(9)	32,005	(14)	72,576	(19)	104,041
(5)	468,202	(10)	53,912	(15)	3,816	(20)	315,792

Worksheet #16

(1)	156,154	(6)	83,616	(11)	520,065	(16)	362,066
(2)	225,192	(7)	244,688	(12)	302,068	(17)	40,482
(3)	242,172	(8)	105,501	(13)	3,393	(18)	130,185
(4)	308	(9)	145,152	(14)	17,748	(19)	120,241
(5)	2,128	(10)	229,332	(15)	449,148	(20)	369,846

Worksheet #17

(1)	313,296	(6)	266,035	(11)	26,082	(16)	33,626
(2)	293,854	(7)	339,976	(12)	105,492	(17)	63,923
(3)	22,820	(8)	512,148	(13)	16,464	(18)	221,564
(4)	70,684	(9)	53,382	(14)	153,758	(19)	839,593
(5)	214,446	(10)	2,405	(15)	36,632	(20)	32,637

Worksheet #18

(1)	13,584	(6)	230,442	(11)	173,124	(16)	13,038
(2)	738,504	(7)	216,408	(12)	36,173	(17)	19,758
(3)	167,088	(8)	85,536	(13)	275,648	(18)	1,196
(4)	363,792	(9)	72,812	(14)	67,907	(19)	36,750
(5)	517,188	(10)	342,210	(15)	550,472	(20)	183,815

Worksheet #19

(1)	1,520	(11)	26,130	(21)	16,995
(2)	18,000	(12)	20,520	(22)	2,088
(3)	202,930	(13)	20,385	(23)	139,216
(4)	26,970	(14)	3,354	(24)	34,782
(5)	2,450	(15)	215,730	(25)	1,242
(6)	261,020	(16)	51,840		
(7)	18,772	(17)	48,441		
(8)	32,512	(18)	389,006		
(9)	3,354	(19)	10,246		
(10)	69,460	(20)	6,622		

Worksheet #20

(1)	14,850	(11)	7,308	(21)	53,280
(2)	18,630	(12)	18,841	(22)	37,030
(3)	5,616	(13)	103,850	(23)	6,324
(4)	165,240	(14)	22,220	(24)	75,520
(5)	65,280	(15)	147,516	(25)	70,680
(6)	335,320	(16)	169,692		
(7)	45,080	(17)	23,200		
(8)	10,670	(18)	10,908		
(9)	63,648	(19)	4,234		
(10)	24,131	(20)	84,630		

Worksheet #21
Zero as a Multiplier

Score
Process
Total

Name_____

Date_____

(A)
$$\begin{array}{r} 432 \\ \times\ 320 \\ \hline 8640 \\ 129600 \\ \hline 138240 \end{array}$$

Rule 1: "Have a row for each multiplier except 0."

Zero Rule: "When you come to a 0 in the multiplier, skip it, go on to the next number and apply rule 2."

Rule 2: "Add a zero at the beginning of the row for each number to the right of the number we multiply with."

Rule 3: "Add the 2 rows."

(B)
$$\begin{array}{r} 913 \\ \times\ 102 \\ \hline 1826 \\ 91300 \\ \hline 93126 \end{array}$$

Rule 1: "Have a row for each multiplier except 0."

Zero Rule: "When you come to a 0 in the multiplier, skip it, go on to the next number and apply rule 2."

Rule 2: "Add a zero at the beginning of the row for each number to the right of the number we multiply with."

Rule 3: "Add the 2 rows."

(A)
$$\begin{array}{r} 576 \\ \times\ 120 \\ \hline 11520 \\ 57600 \\ \hline 69120 \end{array}$$

(B)
$$\begin{array}{r} 726 \\ \times\ 403 \\ \hline 2178 \\ 290400 \\ \hline 292578 \end{array}$$

(1)
$$\begin{array}{r} 836 \\ \times\ 320 \\ \hline 16720 \\ 250800 \\ \hline 267520 \end{array}$$

(2)
$$\begin{array}{r} 567 \\ \times\ 201 \\ \hline 567 \\ 113400 \\ \hline 113967 \end{array}$$

(3)
$$\begin{array}{r} 375 \\ \times\ 140 \\ \hline 15000 \\ 37500 \\ \hline 52500 \end{array}$$

(4)
$$\begin{array}{r} 362 \\ \times\ 160 \\ \hline 21720 \\ 36200 \\ \hline 57920 \end{array}$$

(5)
$$\begin{array}{r} 705 \\ \times\ 104 \\ \hline 2820 \\ 70500 \\ \hline 73320 \end{array}$$

90

Worksheet #22

(1)	166,663	(11)	75,555	(21)	146,472
(2)	214,320	(12)	105,640	(22)	534,870
(3)	283,812	(13)	537,208	(23)	211,960
(4)	59,888	(14)	393,540	(24)	10,112
(5)	336,672	(15)	297,110	(25)	149,985
(6)	43,016	(16)	53,628		
(7)	17,680	(17)	152,388		
(8)	100,111	(18)	209,322		
(9)	59,670	(19)	21,828		
(10)	175,490	(20)	18,120		

Worksheet #23

(1)	68,694	(11)	26,180	(21)	161,840
(2)	155,820	(12)	88,407	(22)	59,843
(3)	113,904	(13)	49,350	(23)	108,817
(4)	76,220	(14)	141,904	(24)	38,388
(5)	11,475	(15)	72,240	(25)	109,874
(6)	57,886	(16)	73,440		
(7)	84,240	(17)	43,945		
(8)	523,800	(18)	32,136		
(9)	426,387	(19)	73,326		
(10)	16,038	(20)	353,683		

Worksheet #24

(1)	289,170	(6)	248,970
(2)	21,710	(7)	79,248
(3)	175,644	(8)	79,488
(4)	164,674	(9)	448,872
(5)	508,740	(10)	615,720

Worksheet #25

(1)	254,848	(6)	319,188
(2)	70,406	(7)	32,640
(3)	372,810	(8)	14,980
(4)	351,696	(9)	121,264
(5)	138,138	(10)	4,150

Worksheet #26

(1)	288,904	(6)	4,981	(11)	97,120	(16)	4,345
(2)	246,820	(7)	6,283	(12)	27,580	(17)	1,610
(3)	667,152	(8)	102,460	(13)	749,736	(18)	14,040
(4)	664,048	(9)	2,592	(14)	329,400	(19)	461,258
(5)	20,280	(10)	165,876	(15)	119,700	(20)	89,648

Worksheet #27

(1)	88,768	(6)	90,228	(11)	391,280	(16)	568,806
(2)	54,720	(7)	339,940	(12)	129,808	(17)	24,660
(3)	19,500	(8)	89,300	(13)	5,194	(18)	346,122
(4)	6,320	(9)	139,860	(14)	17,334	(19)	10,950
(5)	327,804	(10)	103,635	(15)	15,744	(20)	73,260

Worksheet #28

(1)	728	(6)	61,206	(11)	34,748	(16)	5,960
(2)	25,344	(7)	165,920	(12)	73,216	(17)	27,830
(3)	24,700	(8)	313,286	(13)	27,927	(18)	22,275
(4)	25,070	(9)	139,080	(14)	337,792	(19)	71,094
(5)	196,000	(10)	296,976	(15)	27,000	(20)	1,131

Worksheet #29

(1)	2,700	(6)	512,670	(11)	96,767	(16)	611,786
(2)	7,320	(7)	63,875	(12)	48,800	(17)	91,800
(3)	39,636	(8)	1,296	(13)	15,030	(18)	59,920
(4)	207,920	(9)	160,952	(14)	361,197	(19)	2,700
(5)	51,759	(10)	43,100	(15)	18,165	(20)	235,312

Worksheet #30

Zero as a Multiplier in Multiplication

Score
Process_____
Total_____

Name_____

Date_____

$$\begin{array}{r} 346 \\ \times\ 20 \\ \hline 6920 \end{array}$$

Rule:
"When you come to a zero (0) in the multiplier, which is the bottom number, place a zero in the answer row and then multiply by the next number."

$$\begin{array}{r} 754 \\ \times\ 400 \\ \hline 301600 \end{array}$$

(A)	(B)
$\begin{array}{r} 634 \\ \times\ 40 \\ \hline 25360 \end{array}$	$\begin{array}{r} 782 \\ \times\ 300 \\ \hline 234600 \end{array}$

(1) $\begin{array}{r} 836 \\ \times\ 40 \\ \hline 33440 \end{array}$

(2) $\begin{array}{r} 438 \\ \times\ 50 \\ \hline 21900 \end{array}$

(3) $\begin{array}{r} 275 \\ \times\ 500 \\ \hline 137500 \end{array}$

(4) $\begin{array}{r} 582 \\ \times\ 200 \\ \hline 116400 \end{array}$

(5) $\begin{array}{r} 638 \\ \times\ 40 \\ \hline 25520 \end{array}$

Note to Teacher: Item 2 on worksheet IV may present a problem to a child because there will be more zeros involved. (A zero as the ending of a fact)

Worksheet #31

(1)	49,920	(11)	214,500	(21)	262,080
(2)	66,920	(12)	666,688	(22)	269,028
(3)	131,172	(13)	58,520	(23)	18,440
(4)	106,997	(14)	4,224	(24)	23,800
(5)	87,400	(15)	118,558	(25)	17,434
(6)	175,512	(16)	43,740		
(7)	337,792	(17)	251,200		
(8)	11,820	(18)	32,136		
(9)	11,220	(19)	468,720		
(10)	27,392	(20)	111,446		

Worksheet #32

(1)	741,600	(11)	262,724	(21)	758,400
(2)	79,272	(12)	289,200	(22)	60,880
(3)	25,560	(13)	92,208	(23)	55,449
(4)	77,748	(14)	245,210	(24)	7,181
(5)	56,420	(15)	4,500	(25)	164,200
(6)	5,820	(16)	43,792		
(7)	57,400	(17)	39,596		
(8)	110,416	(18)	436,172		
(9)	329,000	(19)	65,836		
(10)	128,792	(20)	57,750		

Worksheet #33

(1)	344,800	(6)	148,338
(2)	66,780	(7)	205,446
(3)	52,740	(8)	247,200
(4)	468,600	(9)	138,600
(5)	23,220	(10)	25,400

Worksheet #34

(1)	32,220	(6)	272,800
(2)	200,512	(7)	36,800
(3)	370	(8)	182,840
(4)	24,440	(9)	20,370
(5)	14,160	(10)	372,500

Worksheet #35

(1)	540	(6)	748,272	(11)	159,640	(16)	300
(2)	313,200	(7)	15,903	(12)	258,430	(17)	37,620
(3)	22,776	(8)	40,596	(13)	722,650	(18)	76,650
(4)	329,654	(9)	13,992	(14)	266,420	(19)	218,000
(5)	215,400	(10)	73,080	(15)	18,424	(20)	17,220

Worksheet #36

(1)	63,360	(6)	20,254	(11)	430,254	(16)	9,560
(2)	491,815	(7)	299,026	(12)	610,200	(17)	14,715
(3)	17,040	(8)	195,500	(13)	61,206	(18)	22,599
(4)	4,514	(9)	350.280	(14)	38,000	(19)	143,104
(5)	12,474	(10)	159,619	(15)	275,530	(20)	97,344

Worksheet #37

(1)	242,172	(6)	108,000	(11)	10,380	(16)	24,182
(2)	19,300	(7)	214,446	(12)	240,500	(17)	402,325
(3)	69,190	(8)	105,072	(13)	384,400	(18)	41,588
(4)	193,680	(9)	470,876	(14)	38,948	(19)	4,745
(5)	98,195	(10)	11,480	(15)	120,384	(20)	4,650

Worksheet #38

(1)	5,561	(6)	296,637	(11)	287,408	(16)	90,470
(2)	45,360	(7)	17,040	(12)	17,640	(17)	112,326
(3)	70,740	(8)	291,960	(13)	125,672	(18)	218,500
(4)	37,900	(9)	280,081	(14)	42,432	(19)	3,080
(5)	147,396	(10)	21,440	(15)	49,440	(20)	1,292

Final Test

(1) 1,786 (2) 18,198 (3) 16,068 (4) 17,992 (5) 780

(6) 1,288 (7) 168,701 (8) 221,616 (9) 438,310 (10) 520,200